EFFECT AND OUTCOME OF HARMFUL TRADITIONAL PRACTICE OF ORAL ADMINISTRATION OF MERCURY IN NEWBORN AND INFANTS

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ABSTRACT

BACKGROUND

Oral mercury administration in newborns and infants is being followed as traditional practice in some rural areas around Chidambaram, Tamilnadu. The symptomatology is similar to a systemic illness like septicaemia. Failure to recognize the administration can lead to neonatal demise.

MATERIALS AND METHODS

It is a descriptive study and was conducted during March 2003 to March 2017 for a period of fourteen years. Newborns and infants admitted with the history of mercury administration or their X-ray abdomen showing mercury pellets were included while those with congenital anomalies and preterm babies were excluded. They were further investigated and treated, on the basis of the presentation.

RESULTS

Total children in the study was forty three neonates and infants, twenty five (58.13%) were given mercury on the first day of life for acrocyanosis. Thirty eight babies (88.37%) became symptomatic on third to fifth day of administration. The common presentations were refusal of feeds, abdominal distension and respiratory distress. All cases were treated symptomatically. Of 43 babies, 31 improved without any complications and 12 babies developed paralytic ileus. Ten babies died with progressive rise in liver enzymes and jaundice, despite the intervention.

CONCLUSION

Health education and awareness must be spread in the community regarding mercury toxicity. Long term effects of mercury should be studied further, as the mercuric salts can be retained in various organs of the body for many years.

KEY WORDS

Acrocyanosis, Mercury Pellet, Newborns and Infants, Abdominal Distension.

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BACKGROUND

Heavy metal toxicity accounts for a large number of diseases but is uncommon in children especially the newborns and infants. The most common heavy metal toxicity in children aged 1 to 5 years is recurrent lead poisoning accounting for 1.4% based on serum lead levels.^[1] Oral mercury administration in newborn and infants is a traditional practice in the rural areas of Tamilnadu.^[2] The symptomatology is similar to a systemic illness like septicaemia. Failure to recognize this administration due to inadequate history taking or appropriate investigation can lead to neonatal demise.^[3] Metallic mercury is a shiny, silver coloured and odourless liquid.^[4]

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MATERIALS AND METHODS

This study was conducted at the Department of Paediatrics, Rajah Muthiah Medical College & Hospital, Chidambaram, Tamilnadu. It is a descriptive study and conducted from March 2003 to March 2017 for a period of fourteen years. Newborns and infants admitted with the history of mercury administration or their X-ray abdomen showing mercury pellets were included (Figure-1). Those with congenital anomalies and preterm were excluded from the study. Thorough history including the locality, socio economic status, type of family, reason for mercury administration, availability of mercury, ingredients given along with it, time of administration, time interval between administration and development of symptoms were obtained from the mother or a care taker. Details regarding birth, maturity, birth weight, feeding habits were also noted. The symptoms of mercury administration like poor feeding, abdominal distension, respiratory distress, convulsions were also noted in the history. Complete physical examination was performed and complications of mercury administration like abdominal distension, dyspnoea, pallor, bulging anterior fontanelle were also noted. The following investigations were done for all cases included in the study: Complete haemogram, urine analysis, stool examination, blood grouping, peripheral smear, renal & liver function tests, septic screening and

radiological evaluation including X-ray chest with abdomen & USG cranium. Cerebrospinal fluid analysis was done in selected cases. Based on their clinical presentations, treatment was initiated. Most babies were treated successfully with nil per oral, nasogastric aspiration with gastric lavage, antibiotics (cefotaxime and metronidazole), diuretics, anti-convulsants (phenobarbitone and phenytoin), appropriate replacement of red blood cells and total parenteral nutrition. Chelating agents were not administered as the pellet can't be absorbed systemically.

RESULTS

Fifty-two new born babies were admitted with a history of oral mercury administration and/ or x-ray showing mercury pellets. Forty-three babies constituted the actual study population, 9 babies were excluded based on the selection criteria. Among the 2476 newborn admissions, fifty-two had oral mercury administration. The male to female ratio was 1.4:1. All the babies belong to the lower socio-economic status. Eighty seven percent of babies were from the rural population. Eight one percent of the babies were from the joint families. Ninety percent of the babies were given mercury as per the advice of grandmother. Thirty-seven babies had a history of mercury administration on the first day of life, while others in their third week of life. Thirty-eight (88.37%) babies developed symptoms within 3 to 5 days after instillation of mercury (Table-1), remaining developed symptoms within 6 to 10 days after instillation. Of the forty-three babies, twelve babies (27.9%) developed complications like paralytic ileus, recurrent apnoea, meningitis, ileus, septicaemia, refractory seizures and renal failure with survival of only two babies (Table-2).

Despite effective treatment, mortality in the complicated cases was 83.33%. But in babies without complications the mortality percent was zero. Haemoglobin estimation showed anaemia in 15 (34.88%) newborns and infants with microcytic hypochromic anaemia in 9 (20.93%) of these babies. There was evidence of sepsis in the form of elevated CRP levels and elevated neutrophil counts with polymorphonuclear predominance in 16 babies (37.2%). Among the complicated cases, 6 babies had E. coli in the blood culture and cerebrospinal fluid analysis confirmed meningitis in 7 babies (58.33%). Stool examination was positive for mercury pellets in 28 babies (65.11%). There was evidence of renal involvement in 16 babies of which 7 babies (43.75%) developed acute renal failure. Three babies (7%) had elevated liver enzymes on admission which returns normal after 5 days. The mean hospital stay was 13.5 ± 2.3 days.

Symptoms	Total Number (n=43)	Percentage (%)
Poor Feeding	25	58.14
Abdominal Distension	15	34.88
Breathlessness	13	30.23
Fits	7	16.28
Vomiting	6	13.95
Reduced Urine Output	6	13.95
Loose Stools	3	6.98
Incessant Cry	3	6.98

Table 1. Presenting Symptoms of Oral Mercury

Administration		
Signs	Total Number (n=43)	(%)
Abdominal Distension	18	41.86
Dyspnoea	16	37.21
Pallor	16	37.21
Anterior Fontanelle Bulge	12	27.91
Abnormal Posturing	9	20.93
Seizures	9	20.93
Hyperthermia	6	13.95
Shock	4	9.30

Table 2. Signs of Oral Mercury Administration

Treatment Outcome	Total Number (n=43)	(%)
Treated	33	76.75
Expired	10	23.25

Table 3. Outcome of Oral Mercury Administration in Newborns and Infants

Figure 3. Mercury Pellets

Figure 4. Mercury Available in The Market

DISCUSSION

Metallic mercury is a shiny, silver coloured and odourless liquid. When administered orally it is not absorbed and excreted in stools [5]. It is given as traditional practice to newborns for checking 1) the patency of the gut and 2) for relieving acrocyanosis (Karapan). But when given as mixture with other ingredients (Like Ocimum sanctum (Tulasi), Cuminum cyminum (Cumin), Trachyspermum copticum (Carom) it gets adsorbed on the gut wall and produces the manifestations. On exposure to mercury the person develops a clinical condition called "PINK DISEASE" featured by flushing, itching, raised BP, excessive sweating and irritability. The flushing produces erythema of the extremities, which serves its purpose to combat acrocyanosis [6]. Other symptoms include cough, respiratory distress, vomiting, diarrhoea, severe renal damage or with CNS symptoms like spasticity, convulsions, and abnormal reflexes [6, 7].

Oral administration of mercury is a harmful traditional practice, in which healthy term newborn and infants are the common victims [7]. It is a peculiar problem prevalent in Cuddalore district. It is widely used in jewellery shops, which is a thriving business in Chidambaram. The use of chelating agents in newborn and infants is controversial because they are not excreted by the immature kidneys and liver [8]. As these organs are relatively immature in newborn and infants and severely affected newborn and infants had some degree of renal impairment, so the use of chelating agents was

deferred [9]. Reports of elemental mercury vapor exposure in children through accidents and occupational practices, and the more recent observations of the increasing use of elemental Hg for magico-religious purposes in urban communities are increasing reported [9, 10]. Elemental and inorganic mercury are used in some traditional therapies and religious practices, for example, Santeria or Espiritismo or Ayurvedic medicine. For ritual reasons, mercury might be burned in a candle, spread in the room, carried as a talisman, or used in another manner [10].

CONCLUSION

Health education and awareness must be spread in the community regarding mercury toxicity. Long term effects of mercury should be studied further, as the mercuric salts can be retained in various organs of the body for many years.

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